

## Claims

We claim:

1. A composite part having an integrated flow channel, comprising:
  - an elongated foam core;
  - a flow channel media attached to said elongated foam core and extending along a first elongated side thereof, said flow channel media defining interstices for the passage of resin;
  - at least one fabric layer secured to said elongated foam core, and enclosing said first elongated side of said foam core, including said flow channel media, to define a resin flow path along said first elongated side.
2. The composite part according to claim 1 wherein said fabric layer further encloses at least a second and third elongated side of said foam core, each of said second and third elongated sides adjoining said first elongated side.
3. The composite part according to claim 1 further comprising fabric tab portions extending from said second and third elongated sides.
4. The composite part according to claim 1 further comprising a second flow channel media attached to said elongated foam core and extending along a second elongated side thereof, said flow channel media defining interstices for the passage of resin.
5. The composite part according to claim 4 wherein said fabric layer encloses said second elongated side of said foam core, including said flow channel media, to define a second resin flow path along said second elongated side.

1 6. The composite part according to claim 5 wherein said second elongated side  
2 is opposed from said first elongated side.

1 7. The composite part according to claim 1 wherein said flow channel media is  
2 bounded by a second fabric layer interposed between said foam core and said flow  
3 channel media.

1 8. The composite part according to claim 1 wherein said second fabric layer is a  
2 substantially closed fabric for preventing a passage through said second fabric of  
3 said foam core into said flow channel media.

1 9. The composite part according to claim 1 wherein said flow channel medium  
2 is a three-dimensional plastic matrix.

1 10. The composite part according to claim 9 where said flow channel medium is  
2 between about 50 to 90% open space.

1 11. A method of making a composite part with an integrated flow channel, said  
2 method comprising the steps of:

3 arranging a fabric layer in a configuration constrained against outward  
4 movement and defining a cavity between opposing surfaces thereof;

5 arranging a flow channel media adjacent at least one of said opposing  
6 surfaces;

7 dispensing a predetermined amount of a self-expanding, self-curable, uncured  
8 structural foam into said cavity, said foam expanding and curing in said cavity at a

9 molding pressure determined by said predetermined amount of said foam and  
10 thereby attaching itself to said fabric layer and said flow channel media to form said  
11 composite structure;

12 freeing said cured composite structure from said constraint of said arranging  
13 step.

1 12. A method as in claim 11 wherein said fabric layer is made from one of the  
2 group consisting of glass fiber, carbon fiber, aramid fiber, linear polyethylene or  
3 polypropylene fiber, and polyethylene fiber.

4 13. A method as in claim 11 wherein said fabric layer is comprised of organic or  
5 inorganic fibers.

6 14. A method as in claim 11 wherein said fabric layer is comprised of polyester  
7 staple mat, glass fiber mat, organic fiber mat and inorganic fiber mat.

8 15. A method as in claim 11 wherein said structural foam is a two-part, self-  
9 expanding, self-curing urethane foam, and a molding pressure of said foam is  
10 controlled so that said foam penetrates at least partially into interstices of said  
11 fabric as it expands and cures.

12 16. A method as in claim 11 further comprising the step of covering at least a  
13 portion of said flow media with a second fabric layer prior to adding said foam to  
14 said cavity, said second layer of fabric substantially preventing said foam from  
15 penetrating into said flow media.

